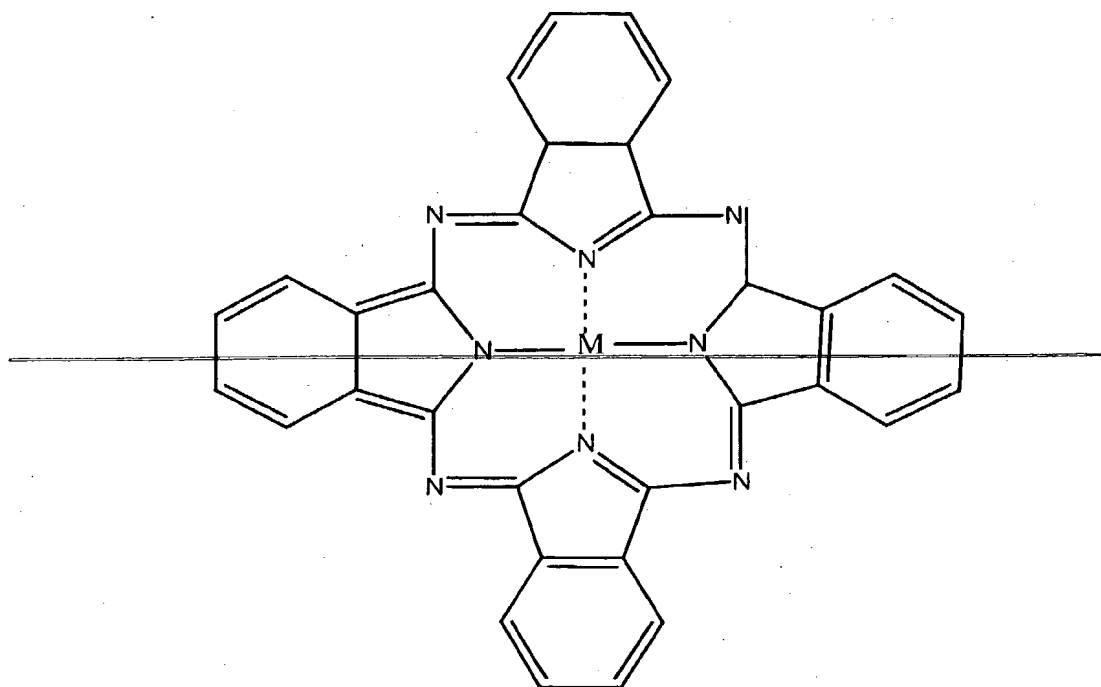


Claim listing

BEST AVAILABLE COPY

I. (Currently amended)

An improved process for the preparation of metal phthalocyanines sulphonamides of the formula I—~~Structural formula of metal phthalocyanine sulphonamide~~



Metal-phthalocyanine (MPc)

$\text{MPc}(\text{SO}_2\text{NHR})_x$

$\text{M} = \text{Co}, \text{Ni}, \text{Fe}, \text{Mn}, \text{Cr}, \text{V}$

$x = 1, 2, 3, 4$

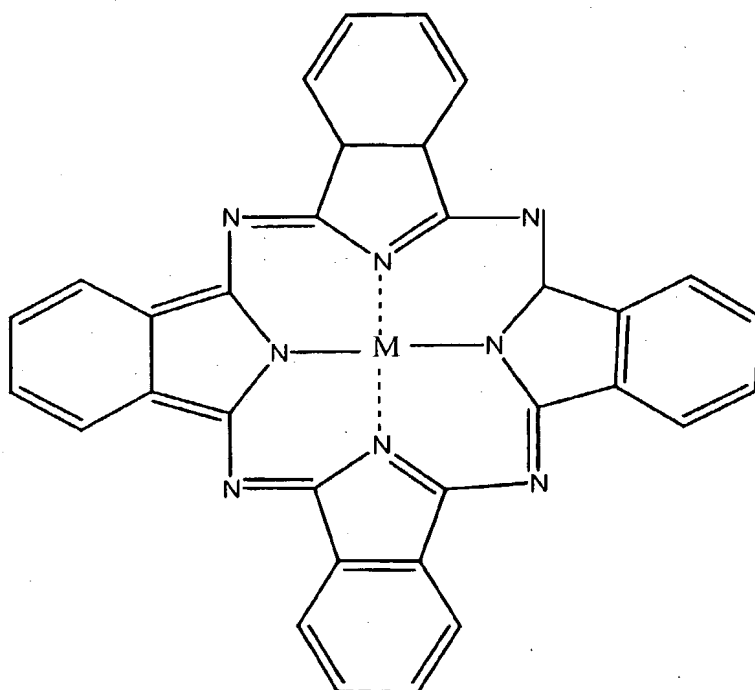
$\text{R} = \text{H}, \text{alkyl}, \text{cycloalkyl},$

Formula I

$\text{MPc}(\text{SO}_2\text{NHR})_x$

wherein MPc represents

UNAVAILABLE COPY



M is Co, Ni, Fe, Mn, Cr or V;

X is 1, 2, 3 or 4 and

R is hydrogen, alkyl, or cycloalkyl.

~~catalyst~~ useful as a catalyst for sweetening of LPG and light petroleum distillates which comprises;  
 reacting a metal phthalocyanine with chlorosulphonic acid at a temperature in the range of ~~90-150°C~~ 90-150°C for a period ranging between 1 hr - 5 hrs, cooling the mixture to a temperature ranging between ~~40-80°C~~ 40-80°C, adding 1-7 parts of a chloride reagent to the said mixture, heating the above said mixture to a temperature ranging between ~~60-80°C~~ 80°C for a period ranging between 0.5 hr to 3 hrs to obtain the metal phthalocyanine sulphonyl chloride, isolating the above said compound by adding the reaction mixture in an ice cold water, reacting the above isolated metal phthalocyanine sulphonyl chloride with an amine of general formula  $H_2NR$   $H_2NR$  where R is selected from hydrogen, aryl, alkyl and cycloalkyl in an aqueous or non aqueous medium or a mixture thereof at a temperature in the range -4 to ~~15°C~~ 15°C and at a pH ranging between 7-9 in the presence of an acid binding agent to obtain the desired catalyst.

2. (Original) An improved process as claimed in claim 1, wherein the metal phthalocyanine used is selected from the group consisting of cobalt, manganese, iron, nickel, chromium and vanadium phthalocyanine, most preferably cobalt phthalocyanine.

3. (Previously submitted) An improved process as claimed in claim 1 wherein the chloride reagent used is selected from the group consisting of thionyl chloride, phosphorous trichloride

UNAVAILABLE COPY

and phosphorous trichloride and phosphorous pentachloride.

4. (Previously amended) An improved process claimed in claim 1 wherein the non-aqueous medium used is selected from the group consisting of chlorobenzene, nitrobenzene, alcohols and N, N-dimethylformamide.

5. (Previously amended) An improved process as claimed in claim 1 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

6. (Currently amended) An improved process as claimed in claim 1 wherein the catalyst prepared is metal phthalocyanine sulphonamide selected from the group consisting of cobalt, manganese, nickel, iron, vanadium phthalocyanine sulphonamides ~~and their substituted sulphonamide derivatives, most preferably selected from cobalt phthalocyanine tetra-sulphonamide and cobalt phthalocyanine tetra-N15-4-hydroxy phenyl) sulphonamide.~~

7. (Previously submitted) An improved process as claimed in claim 2 wherein the chloride reagent used is selected from the group consisting of thionyl chloride, phosphorous trichloride and phosphorous trichloride and phosphorous pentachloride.

8. (Previously submitted) An improved process claimed in claim 2 wherein the non-aqueous medium used is selected from the group consisting of chlorobenzene, nitrobenzene, alcohols N,N-dimethylformamide.

9. (Previously submitted) An improved process claimed in claim 3 wherein the non-aqueous medium used is selected from the group consisting of chlorobenzene, nitrobenzene, alcohols and N, N-dimethylformamide.

10. (Previously submitted) An improved process claimed in claim 7 wherein the non-aqueous medium used is selected from the group consisting of chlorobenzene, nitrobenzene, alcohols and N, N-dimethylformamide.

11. (Previously submitted) An improved process as claimed in claim 2 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

12. (Previously submitted) An improved process as claimed in claim 3 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

13. (Previously submitted) An improved process as claimed in claim 4 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate; sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

14. (Previously submitted) An improved process as claimed in claim 7 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

15. (Previously submitted) An improved process as claimed in claim 8 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

16. (Previously submitted) An improved process as claimed in claim 9 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

17. (Previously submitted) An improved process as claimed in claim 10 wherein the acid binding agent used is selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium hydroxide and tertiary organic bases selected from pyridine, triethyl amine and piperidine.

18. (Currently amended) An improved process as claimed in claim 2 wherein the catalyst prepared is metal phthalocyanine sulphonamide selected from the group consisting of cobalt, manganese, nickel, iron, vanadium phthalocyanine sulphonamides and their - substituted sulfonamide derivatives, ~~most preferably selected from cobalt phthalocyanine tetra-sulphonamide and cobalt phthalocyanine tetra-N15 4-hydroxy phenyl) sulphonamide.~~

19. (Currently amended) An improved process as claimed in claim 3 wherein the catalyst prepared is metal phthalocyanine sulphonamide selected from the group consisting of cobalt, manganese, nickel, iron, vanadium phthalocyanine sulphonamide and their - substituted sulfonamide derivatives, ~~most preferably selected from cobalt phthalocyanine tetra-sulphonamide and cobalt phthalocyanine tetra-N15 4-hydroxy phenyl) sulphonamide.~~

20. (Currently amended) An improved process as claimed in claim 4 wherein the catalyst prepared is metal phthalocyanine sulphonamide selected from the group consisting of cobalt, manganese, nickel, iron, vanadium phthalocyanine sulphonamide and their - substituted sulfonamide derivatives, ~~most preferably selected from cobalt phthalocyanine tetra-sulphonamide and cobalt phthalocyanine tetra-N15 4-hydroxy phenyl) sulphonamide.~~

21. (Previously submitted) A process as claimed in claim 2 wherein the metal phthalocyanine is cobalt phthalocyanine.

22. (Newly submitted) A process as claimed in claim 1 wherein said catalyst is selected from cobalt phthalocyanine tetra-sulphonamide and cobalt phthalocyanine tetra-N15 4-hydroxy phenyl- sulphonamide..